

# Effective Economic Factors on Supply Chain in Cement Industry with Applying SCOR1 model (Case study: Firozkuh Faraz Cement Company in Iran)

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**Abstract:** Nowadays, time and cost control are key functions in the organizations. In the recent competitive conditions, organizations must get know about their costs in comparison with their rivals in the market for keeping survival and competition power and they enter in the competitive environment according with cost dimension actively. In this case, supply chain pattern and SCOR model help significantly them to obtain above objectives, custom satisfaction, and attract more customs for organization. This paper tries to investigate the supply chain pattern and its problems and also takes a look on SCOR model by Statistical methods, economical factors, and implementation the supply chain in Cement Industry.

**Key terms:** supply chain, SCOR model, economical factors, and Cement Industry

## 1. Introduction

The supply chain is introduced as a modern issue in economic science that improves rapidly in company with growing IT and communications. The effective elements in the supply chain have spotlighted roles in new transitions. Unity is recognized as a key role in the supply chain. Therefore, firms, that tend to create a sense of competition in an occupational environment, must have a structure of unity and cooperation in a logical time and risk. The unity is necessary for consuming fewest sources in a production process, faster delivery, and optimization.

These factors cause to increase the efficient through sharing the tasks and the presence of them in the market on time cause to go up the portion of each corporation in the produced

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<sup>1</sup> . Supply Chain Operation Reference

goods. On the other hand, with optimizing the methods, firms can reach to the maximum profit.

This paper tries to scrutinize the supply chain and financial flow. The supply chain aims at keeping balance in distribution cycle and decreasing the production costs.

For this reason, the SCOR model covers the indices, techniques, and characteristics of implementation in the supply chain that its purpose is to provide the standards for firms which they use the supply chain in their operations. The SCOR model is the first model that can be utilized in constructing the body of the supply chain based on business strategy. Operation Reference model brings about cooperating all organizations, which using the supply chain unity, for enlarging productivity.

## **2. The supply chain**

The supply chain contains the financial flow, materials flow, and data flow among various facilities such as salespersons, manufacture and montage factories, stores, final customs, and distribution centers.

The main process of the supply chain isolates into four head parts included of production planning, control, distribution, and support. Also, this process covers stock management, goods transportation, information, and services to the final customs.

### **2.1. The problems of the supply chain and its sources**

Totally, the problems of the supply chain generate from two main sources:

1. Lack of certainty: the main reason is prediction of demand and delivery time such as the fault in machinery.

2. Non harmony: when this problem occurs that there are not any appropriate relations among parts of an organization. The messages for business partners are understandable. So the segments of the firms don't aware from others parts<sup>2</sup>.

#### 2.2.1. The problems during the supply chain

There are numerous problems that can be occurred in during the supply chain. In here, we want to discuss the two worst problems.

1. The bullwhip effect: this problem derives from order irregular changes in during the supply chains. However the real sell in the stores is fix and predictable, but the orders cause to create hard fluctuations for distributors and wholesalers.
2. Phantom stock out: this problem when occurs that the customs wants the product which is not available. However it exists in reality. For example, the goods distributed in an incorrect place<sup>3</sup>.

#### 2.2. Measurement the operations and indices in SCOR model

The supply chain can be taken into account as an outside process in obtaining more profits. According to this issue, SCOR model uses a series of indices that keeps under control from total indices to formal operation indices. The main indices groups are:

- ❖ Assurance: this part contains delivery on time, price of orders completion, time of order delivery, and completes the orders totally.
- ❖ Flexibility and accountability: includes of time of chain accountability and time of completing orders.
- ❖ Cost: includes of cost of distribution chain management, staff's added value efficiency, and cost of quality guarantee.

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<sup>2</sup> . Turban(2003)

<sup>3</sup> .Turban(2003)

- ❖ Property: contains time of cash to cash cycle (the time that a spent currency unit turns back into company income), the days of supplying stock (the speed of production and selling), and property twist (the ratio of income to property).

### 2.3. The bourgeon of the SCOR model

This model includes of suppliers and customers. In this limitation, the SCOR includes of the following cases:

- ❖ All customs' exchanges, from orders input to receive a payment receipt.
- ❖ All product exchanges (physical products, service) from suppliers to customs such as spare equipment, software, and so on.
- ❖ All market exchanges, from demand rate to their accountability.

But the SCOR model doesn't try to describe the processes as examples of marketing and selling, research improvement, technology, productions improvement, and services after sale<sup>4</sup>.

### 2.4. Indices tasks:

- ❖ Information: the indices can give necessary information to management for making a correct decision and verify the problems and also compare with goal amounts.
- ❖ Direction: the indices can be a base for installing the purpose and can cause to direct the process toward the aim.
- ❖ Control: indices can be applied for control and supervision the process.

In the past, most indices are calculated by national data but because of concentrating supply chain management on customs, unity, and cooperation so others criteria must be considered except of financial standards. In accordance with above words, this work makes a concept of balanced score card that it is covered financial criteria, customs'

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<sup>4</sup> . Supply Chain Council(2009)

criteria (customs' satisfaction), internal trading, and innovation and learning (quantities of staff's suggestions).

## **2.5. The supply chain cost management and pricing based on value**

The continuous tendencies in the most global markets make more pressure on decreasing costs till profit margin stays like the past. An essential change in the world competitive outlook is directing the costs towards lower level. There are some factors that play important roles in making new market environment:

1. New rivals entered into the market that they are supported by manufacture companies.
2. Removing the obstacles and deleting the hard regulations in the market cause to accelerate business procedure. Also let the new players control the market.
3. The internet is another reason for going down the costs. Because it can make the comparison the costs easier. In addition, the internet creates the big sales, wide exchanges in industry level, and decreases the prices.
4. The customs and consumers found more conscious about goods value. According to the continuous pressure on going down the prices, it is obvious that the firms must find a way for saving their profits<sup>5</sup>.

## **2.6. The challenge of the supply chain costs**

For long years, people believed that the key of decreasing the cost isn't organization inner activities but it depends upon the supply chain. Hence, this issue is cited in 1929: during a fifty- year process (from 1870 to 1920) the cost of distributions became about triple. But the costs of production descended almost one- fifth. Therefore, what we economize, they will be lost in distribution.

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<sup>5</sup> .jazemi,reza(2007)

If the major part of costs in an organization gained out of its occupation border, we can take a result that the biggest improvement chances cache in the supply chain.

### **3. Cement Industry**

Since 1979, Iran Cement Industry has entered in a new period. The main characteristics of this period mention the following:

1. The reduction of government's supervision on pricing and distribution.
2. The macro investment in Cement Industry by government, bank, some public institutes, and private ones.
3. The efficiency of the Cement projects.

#### **3.1. The positive and negative effective on creating a new attitude in Cement Industry**

##### **3.1.1. The negative factors (preventers):**

1. Lack of investment security
2. The policy of price control
3. The policy of exchange rate control
4. The progressive tax

##### **3.2.1. The positive factors**

1. Increasing export
2. Economizing in the energy
3. Research projects and development designs
4. Declining the equipment and imported items
5. The total movement for thrift in Cement factories

#### **4. The supply chain implementation in Cement Industry using SCOR model**

##### **4.1. Customer loop**

\_The discussion of orbit-custom and the attraction of customs are the most important and necessary principles in Cement Industry.

\_ Access an internet buying system for purchasing Cement and prevent the waste of time in front of factory.

\_ The use of new automatic service system for reducing expectation time can be fruitful for custom attraction. So the use of the radio frequency ID system (RFID) causes to go down the time, invisible automation control, security, and unity in the organization.

In the custom part, the following indices are taken into account for evaluation<sup>6</sup>:

$$\text{Inner custom satisfaction rate} = \left( \frac{\text{gained score rate}}{\text{total score}} \right) \times 100^7$$

Current situation in Firuzkuh Faraz Cement Company is 80% and should increase to 90% during 3 months.

$$\text{Custom satisfaction rate} = \left( \frac{\text{gained score rate}}{\text{total obtainable score}} \right) \times 100$$

Current situation is 84% and should increase to 90% during 6 months.

$$\text{The percent of turning back the product to factory} = \frac{\text{the amount of regressive product}}{\text{total produced items}} \times 100$$

Current situation is 1 and should decrease to 0 during 6 months (Ideal situation).

#### 4.2. The loop of suppliers

It is conspicuous for having a good trading in long time; the company needs to communicate face to face with the customs or having relationship through facsimile (FAX) and email. In choosing the suppliers, we encounter to four main factors: quality, price, quantity, and delivery time. On the other hands, there are some other factors that are very

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<sup>6</sup>.All formulas gain from ISO 9001:2008 and Principles of production and inventory planning and control book(Haj shir mohammadi, Ali)

<sup>7</sup>.These scores gain from costumers behaviors forms.

necessary in the process: seller's business background, association with small companies, and keep the environment.

\_ The indices that are being analyzed in this section are:

$$\text{Corresponding rate} = \frac{\text{the amounts of accepted consiments}}{\text{total amounts of purched consiments}} \times 100$$

Current situation is 85% and should increase to 90% during 6 months.

$$\text{Delivery rate} = \frac{\text{the amounts of purchased consiments}}{\text{total amounts of purchased consiments}} \times 100$$

Current situation is 90% and should increase to 95% during 6 months.

### 4.3. The loop of inner- company

One of the most important cases in each company is to analyze economic and technique factors in inner-company. In here, we want to describe the factors that play highlight roles in the supply chain operation reference.

- Management and stock control

The main purpose of supply chain is to create assurance and useful flow from materials and services in the chain rings. In general speaking, the service doesn't store. But the physical productions can be accumulated in the chain rings as "stock". Accumulating and storing the various steps and supply chain rings are very expensive. But in another way, it's necessary and unavoidable for preventing from waste of time and extra costs.

The most important indices in this part are:

$$\text{Stock value average} = \frac{\text{the sum of all stock in frequencies of measurment}}{\text{the measurement frequenccies}}$$

$$\text{Weeks of supply} = \frac{\text{stock value average}}{\text{the average of weekly money mass}}$$

The two above indices must be decreased.

$$\text{Stock circulation} = \frac{\text{annual money mass}}{\text{stock average}}$$

This index must be increased.

The ratio of store Dollar stock to investment =  $\frac{\text{store Dollar stock}}{\text{investment in circulation}} \times 100$

Current situation is 74% and should decrease to 69% during 1 year.

The percent of storing contrast =  $\frac{\text{real Rial stock of store}}{\text{financial position accord to Rial stock of store}} \times 100$

Current situation is 0 and should remain 0 this year,

Of course, making a decision in this part depends upon the above indices and costs such as the costs of facing with item shortage, company's credit loss because of delaying in delivery or no delivery the items or services<sup>8</sup>.

\_ Surrendering the activities

In this section, the company surrenders the service and repair tasks to others contractors.

\_ Maintaining and repair system

With controlling and protecting from parts and machines, the company can prevent from stopping the production line. And also it can decline repair and replacement costs.

\_ Paper less system

All requests, corresponding, and calculations are run by software. Therefore, this work helps to remove paper and to go down the waste of time.

The necessary indices for evaluating and analyzing the processes of company

The average of coincidence percentage =  $\frac{\text{total coincidence in each product}}{\text{the amounts of products}} \times 100$

Current situation is 95% and should increase to 97% during 3 month.

The percent of non-coincidence =  $\frac{\text{the amounts of non coincidence product}}{\text{the amount of produced item}} \times 100$

Current situation is 5% and should decrease to 3% during 6 months.

The percent of stoppage due to fault =  $(1 - \frac{\text{the operation time of machine}}{\text{total of time}}) \times 100$

Current situation is 95% and should increase to 97% during 3 month.

The cost of repair per one tone =  $(\frac{\text{repair costs}}{\text{tonnage}})$

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<sup>8</sup>.Haj shir mohammadi, Ali(2003)

Current situation is 37000 Rials<sup>9</sup> and should decrease to 30000 Rials during 6 month (Purpose is cost decreasing).

The frequency of lack of coincidence =  $\frac{\text{the number of the frequency of lack of coincidence}}{\text{the numbers of total lack of coincidence}}$

This process didn't register, but should be 80% after 6 months.

With putting a particular principle in the supply chain ring, in spite a company can control costs. Even it can control the time of product process, delivery, and gain custom's satisfaction.

## 5. Conclusion

In the supply chain system, every of processes are defined in the competitive space. In this space, the prices distribute based on demands and presentations. In the equilibrium point of the price and the point that relates to demands and presentations, the amounts of produced items are ascertained, too. Every company tries to decrease the prices for attracting the customs. Therefore, declining the price, declining time, increasing quality, and accountability are the most important factors in today's market.

In Cement Industry, according to adding more Cement factories to market cycle, the export plays the essential role in competitive market. On the other hands, in conformity with low price of Cement in china, India, Pakistan, and even Turkey, it is necessary that all purposes of the supply chain must be considered and reached.

Finally, the implementation of SCOR model has economic advantages for the organizations:

- \_ Increasing organization's selling rate continuously
- \_ Decreasing the costs
- \_ Reinforcing organization's financial operation

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<sup>9</sup>.Iran currency name is Rial.

- \_ Improving the communication with customs
- \_ Increasing selling share in the market
- \_ Increasing the customs rate permanently
- \_ Improving organization's cash flow
- \_ Improving in return investment
- \_ Decreasing wasted costs in the organization
- \_ Decreasing the costs of process
- \_ Decreasing delivery time in the market
- \_ Decreasing time of production
- \_ Decreasing time of stoppage
- \_ Decreasing the operation costs

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